Owner's Guide

CASCADE® 3181 & A-DEC 4631 DUO DELIVERY SYSTEMS AND A-DEC 4635 ASSISTANT'S

a-dec®

85.2643.00

Products List | Print | Table of Contents

Warranty Information

Serial Number _____

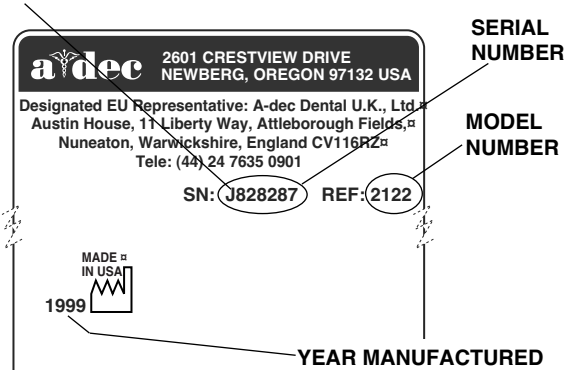
Model Number _____

Date Purchased _____

Date of Service	Model/Description of Service	Technician's Initials

ALPHABETICAL EQUIVALENT TO THE NUMERAL OF THE MONTH MANUFACTURED

A	January
B	February
C	March
D	April
E	May
F	June
G	July
H	August
I	September
J	October
K	November
L	December



SERIAL NUMBER IDENTIFICATION

Serial Number Location:

- 3181: On the bottom of the control head.
- 4631: On the control head housing.
- 4635: On the assistant's instrumentation housing.

For service information contact your local authorized A-dec dealer.

Check with local codes and A.D.A. (Americans with Disabilities Act) requirements for installation of this product.

A-dec warrants its products and A-dec/W&H handpieces against defects in material or workmanship for one year from time of delivery. A-dec's sole obligation under the warranty is to provide parts for the repair, or at its option, to provide the replacement product (excluding labor). The buyer shall have no other remedy. (All special, incidental, and coincidental damages are excluded.) Written notice of breach of warranty must be given to A-dec within the warranty period. The warranty does not cover damage resulting from improper installation or maintenance, accident or misuse.The warranty does not cover damage resulting from the use of cleaning, disinfecting or sterilization chemicals and processes. The warranty also does not cover light bulbs. Failure to follow instructions provided in A-dec's Operation and Maintenance Instructions (Owner's Guide) may void the warranty.

A-dec warrants A-dec dental chair cylinders, both lift and tilt, for ten years from the date of purchase of the chair or the cylinder. This warranty is retroactive to A-dec chair cylinders already in the field. The warranty covers chair cylinders A-dec finds to have manufacturing related irregularities. Stool cylinders **are covered under A-dec's one-year warranty.**

NO OTHER WARRANTIES AS TO
MERCHANTABILITY OR OTHERWISE ARE MADE.

a-dec®

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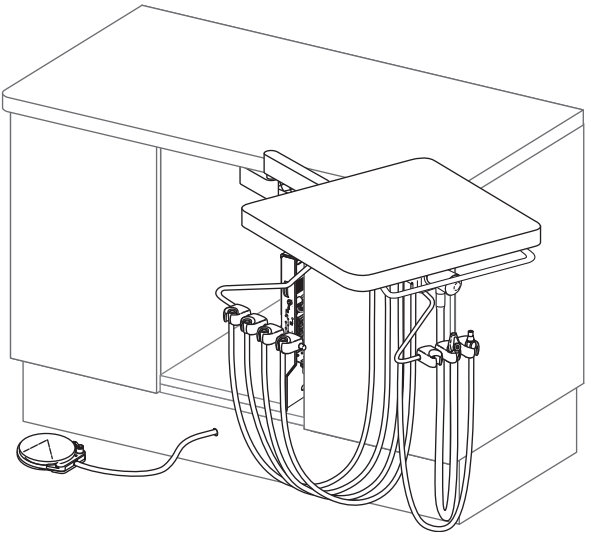
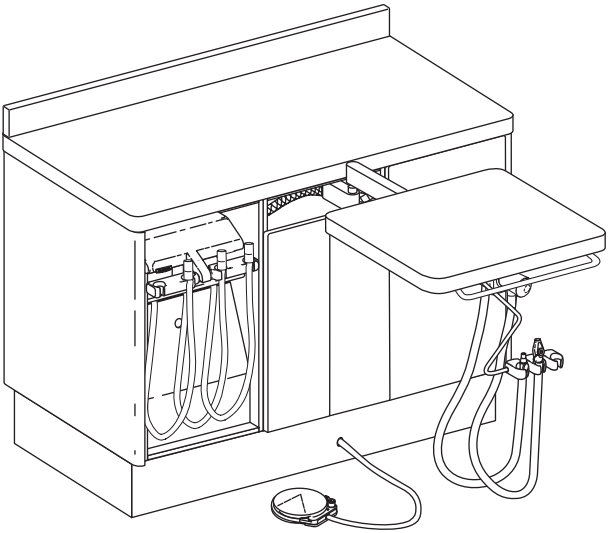
Serial number location, service information, and warranty information are located on the inside front cover and front page.



A-dec 4631 Duo Delivery System



Cascade 3181 Duo Delivery System

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Handpiece Delivery System

Your delivery system is built around A-dec's Century Plus® control system.

Handpiece Actuation

Handpiece activation is automatic. When you lift a handpiece from its holder the handpiece becomes active and will run when you press on the foot control disc *(refer to page 9)*.

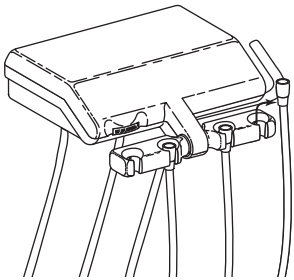

Figure 1. Handpiece Actuation

Drive Air Pressure Gauge

The drive air pressure gauge indicates, in psi and kg/cm^2, the drive air pressure to the active handpiece.

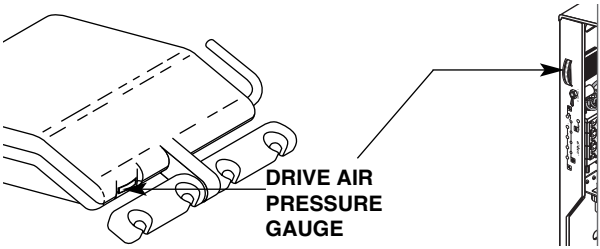

Figure 2. Drive Air Pressure Gauge

Handpiece Controls

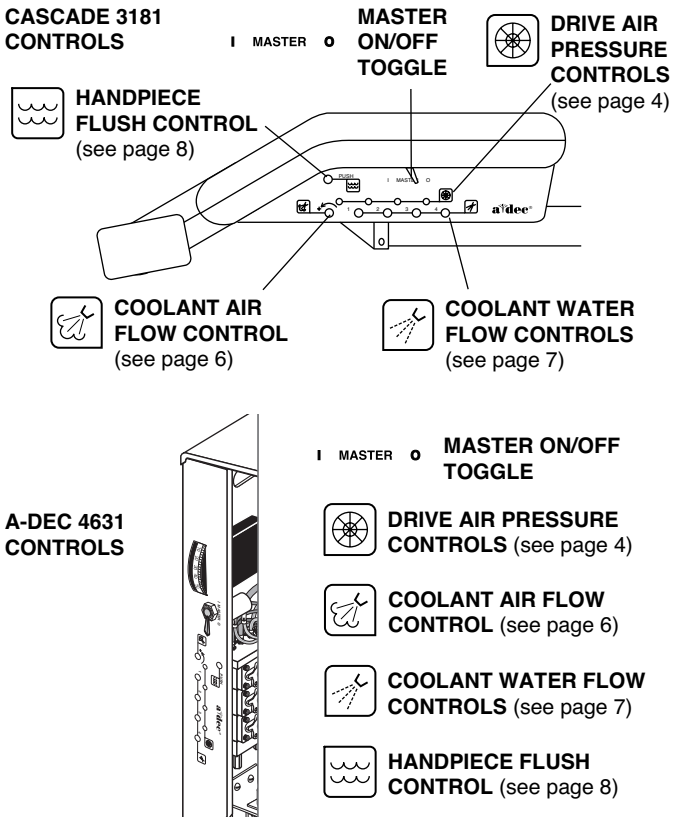
CASCADE 3181 CONTROLS
I MASTER O
MASTER ON/OFF TOGGLE
DRIVE AIR PRESSURE CONTROLS (see page 4)
HANDPIECE FLUSH CONTROL (see page 8)
COOLANT AIR FLOW CONTROL (see page 6)
COOLANT WATER FLOW CONTROLS (see page 7)
A-DEC 4631 CONTROLS
I MASTER O
MASTER ON/OFF TOGGLE
DRIVE AIR PRESSURE CONTROLS (see page 4)
COOLANT AIR FLOW CONTROL (see page 6)
COOLANT WATER FLOW CONTROLS (see page 7)
HANDPIECE FLUSH CONTROL (see page 8)

Figure 3. Handpiece Controls

Adjustment keys are provided for making adjustments to the recessed controls. You can order additional or replacement keys from your authorized A-dec dealer, or use a 1/8" hex key.

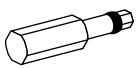

Figure 4. Autoclavable Control Key

Master On/Off Toggle

I MASTER O

The **master on/off toggle** *(see Figure 3)* turns air, water, and electricity on or off to the system.

CAUTION

The MASTER ON/OFF TOGGLE should be in the OFF (0) position whenever the unit is not in use.

This will prevent the possibility of water damage should a leak occur while the unit is unattended.

Making sure the unit is off will also prevent the possibility of self-activation and the resulting burn-out of your electrical accessories.

Drive Air Pressure Controls

The drive air pressure controls *(see Figure 3 on page 3)* are used to adjust the drive air pressure to each handpiece.

Adjust the drive air pressure to meet the handpiece manufacturer's dynamic drive air pressure specification. Refer to the documentation that came with your handpiece for the dynamic drive air pressure specification.

Use a 3⁄32" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the drive air gauge on the front of the control head *(see Figure 2 on page 2)*.
3. Move the wet/dry toggle on the foot control *(see Figure 6 on page 9)* to the OFF position, away from the blue dot).
4. Turn the drive air control clockwise until the valve seats.
5. Fully depress the foot control disc.
6. While running the handpiece, watch the drive air gauge and adjust the handpiece dynamic drive air pressure to meet manufacturer's specifications.
   - Turn the drive air control counterclockwise to increase drive air pressure flow.
   - Turn the control clockwise to decrease flow.

NOTE

Do not turn the control counterclockwise beyond the point where the drive air pressure no longer increases. The control adjustment screw may come completely out of the unit.

7. Repeat steps 1 through 6 for **each** handpiece.

Coolant Air Flow Control

The coolant air flow control *(see Figure 3 on page 3)* is used to adjust the coolant air flow to all handpieces.

Use an adjustment key *(see Figure 4 on page 3)* or a 1⁄8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant air control *(see Figure 3 on page 3)*.
3. Move the wet/dry toggle on the foot control *(see Figure 6 on page 9)* to the OFF position, away from the blue dot.
4. Insert an adjustment key, or a 1⁄8" hex key, into the coolant air flow control.
5. Fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant air flow to fit your needs. A strong flow of air is recommended.
   - Turn the control clockwise to decrease the flow.
   - Turn counterclockwise to increase the flow.
7. The coolant air has been set for **all** handpieces.

Coolant Water Flow Controls

The coolant water flow controls are used to adjust the flow of coolant water to each handpiece *(see Figure 3 on page 3)*.

Use an adjustment key *(see Figure 4 on page 3)* or a 1⁄8" hex key to complete this adjustment.

1. Install a bur in the handpiece.
2. Locate the coolant water flow controls *(see Figure 3 on page 3)*.
3. Move the wet/dry toggle on the foot control *(see Figure 6 on page 9)* to the ON position, *toward the blue dot*.
4. Insert an adjustment key, or a 1⁄8" hex key, into the coolant water flow control for the handpiece being adjusted.
5. Hold the handpiece over a receptacle. Hold the handpiece so that the water will be directed away from you and into the receptacle.

   Then fully depress the foot control disc to activate the handpiece.
6. Adjust the coolant water flow to fit your needs.
   - Turn the control clockwise to decrease the flow.
   - Turn counterclockwise to increase the flow.
7. Adjust the coolant water for **each** handpiece.

Handpiece Tubing Flush

The handpiece tubing flush system flushes more water through the tubings in less time than is normally possible when operating only the foot control. Disconnect the handpieces before flushing the tubings.

After each patient, the handpiece tubing should be flushed for about 20–30 seconds.

At the beginning of each day, the handpiece tubing should be flushed for about 2–3 minutes.

Flushing the Handpiece Tubings

Gather up all the handpiece tubings that use coolant water and hold them over a sink, cuspidor bowl or basin. Be sure you hold the tubings so that the water will be directed away from you and into the receptacle *(see Figure 5)*.

Insert an adjustment key or 1/8" hex key into the handpiece tubing flush control on the side of the control head. Push in and hold the key for the appropriate time required, either for flushing between patients or flushing at the beginning of each day, depending on the situation. Remove the key and replace the tubings in their holders.

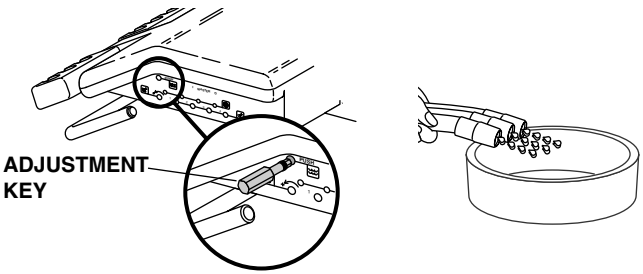

Figure 5. Handpiece Tubing Flush

Foot Control

The foot control modulates drive air to the active handpiece and provides an air signal that activates the coolant air and coolant water flow. The foot control is operated by light foot pressure applied to any part of the foot control disc.

The foot control is equipped with a wet/dry toggle and can be equipped with an optional chip blower button *(see Figure 6)*.

Wet/Dry Toggle. Allows you to shut off the coolant water to the handpiece without moving your hands from the oral cavity. Using your foot, move the toggle away from the blue dot to turn the coolant water OFF. Move the toggle toward the blue dot to turn the coolant water ON.

Chip Blower Button. Sends a jet of air through the handpiece when it is not running.

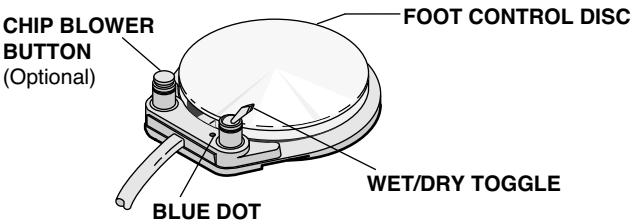

Figure 6. Foot Control

Adjustments

Mounting Arm Tension Adjustments

The mounting arm for the work surface can be adjusted to rotate at the desired resistance.

1. Using a 1/8" hex key, tighten or loosen the three setscrews in the mounting arm.

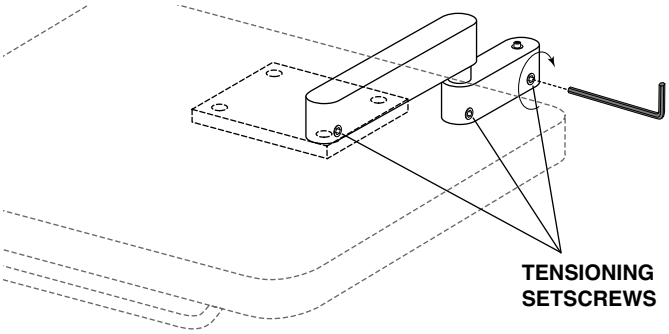

Figure 7. Arm tension adjustment

Work Surface Repositioning

The work surface can be repositioned, thereby maximizing space in the operatory.

1. Using a 1/8" hex key, remove the delivery system assembly by removing the two front screws and washers.
2. Remove the work surface from the mounting arm by removing the two back screws and washers.
3. Reposition the work surface to align with the appropriate mounting holes.
4. Install the work surface to the mounting arm using the two back screws and washers.
5. Install the delivery system assembly using the two front screws and washers.

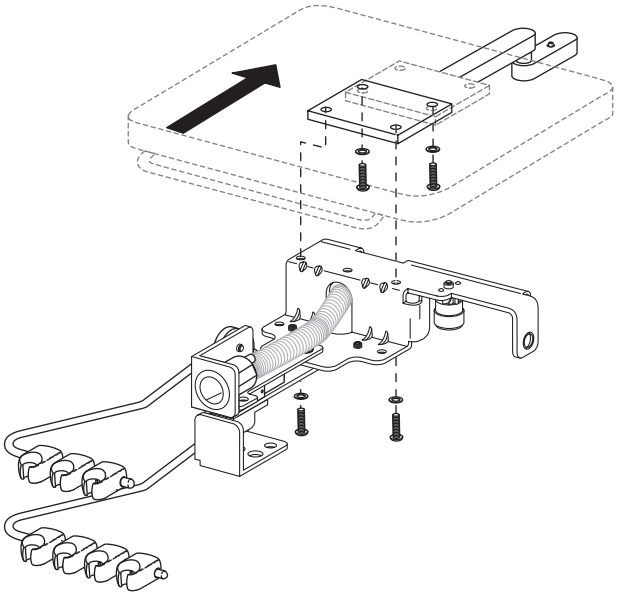

Figure 8. Arm tension adjustment

Doctor's/Assistant's Instrumentation Arm Tension Adjustments

The doctor's or assistant's instrumentation arms can be adjusted to the desired resistance.

1. Using a wrench, tighten or loosen the tensioning hex nut on the underside of the doctor's or assistant's instrumentation housing.

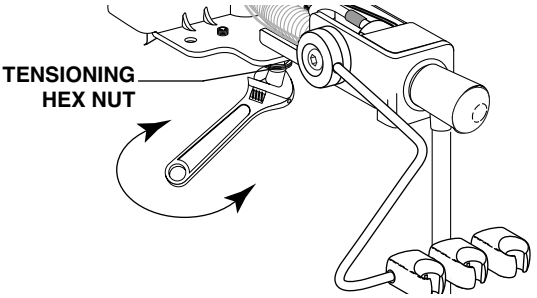

Figure 9. Arm tension adjustment

Holder Bar Tension Adjustments

The doctor's or assistant's instrumentation holder bar can be adjusted to the desired resistance.

1. Using a 5⁄32" hex key, tighten or loosen the tensioning screw on the side of the doctors or assistant's instrumentation holder bar.

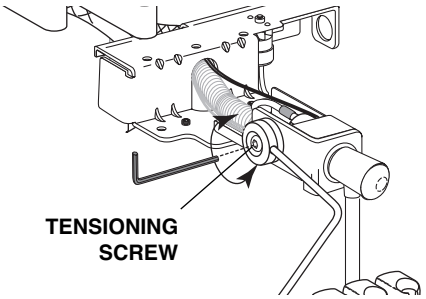

Figure 10. Arm tension adjustment

Handpiece Holder Tension Adjustment & Positioning

The holder tension was set at the factory. However, if a holder is difficult to reposition or repositions too easily, the holder tension can be adjusted.

To adjust the holder tension:

- Loosening or tightening the tension adjustment screw shown in Figures 11A and 11B.

To reposition a holder:

- Rotate the holder to the desired angle.

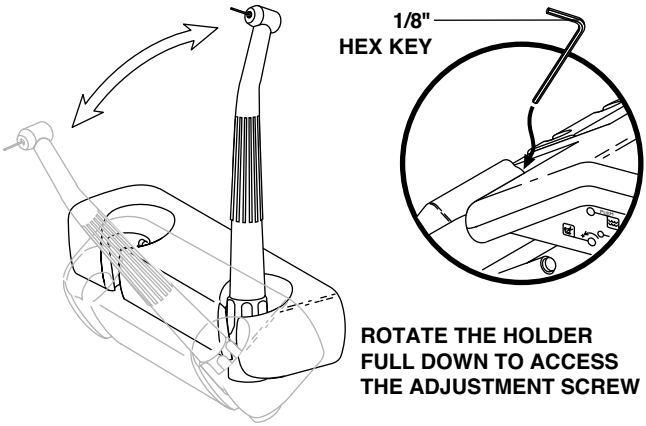

Figure 11A. Unitized Handpiece Holder

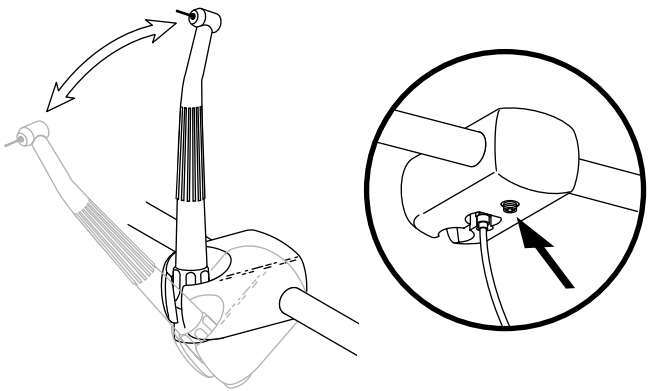

Figure 11B. Individual Handpiece Holder

Tray Holder Left/Right Conversion

The optional tray holder can be easily mounted on either side of the unit work surface.

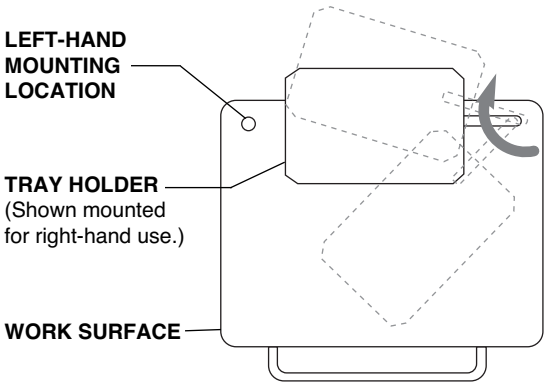

Figure 12. Tray Holder Left/Right Conversion

1. Remove the plug from the work surface corner opposite the current tray holder location.
2. Remove the tray holder from the unit's work surface and set aside.
3. Remove the brass tray holder bushing from the work surface by removing the 9/16" hex nut (located on the underside of the work surface) that secures the bushing to the work surface.
4. Lift the brass bushing from its seat and move it to the opposite side of the unit work surface.
5. Install the 9/16" hex nut to the new position and tighten the hex nut.
6. Install the tray holder into the brass bushing.
7. Place the plug into the open tray holder hole.

Handpiece Dry Block Conversion

The handpiece control system has one to four handpiece control blocks with coolant water to the handpiece. If you require a dry block (offering no water to the handpiece) on your handpiece control system, a dry block conversion kit has been included with your system.

Installing the Dry Block Conversion Kit

1. Move the master on/off toggle to the OFF position. Bleed the system water by operating the syringe and flushing the handpiece tubings.
2. Locate the handpiece control block position that will be the dry block. Access the control blocks underneath the control head.
3. Use a 3/32" hex key to remove the large red cartridge from the control block. Install the large black cartridge from the dry block conversion kit into the control block *(see Figure 13)*.
4. Use a 3/32" hex key to remove the small blue cartridge from the same control block. Install the small black cartridge from the dry block conversion kit into the control block *(see Figure 13)*.
5. Turn your handpiece control system on, then check the function of the dry block handpiece conversion. A small amount of residual water may be discharged from the handpiece tubing but should dry after a few seconds.

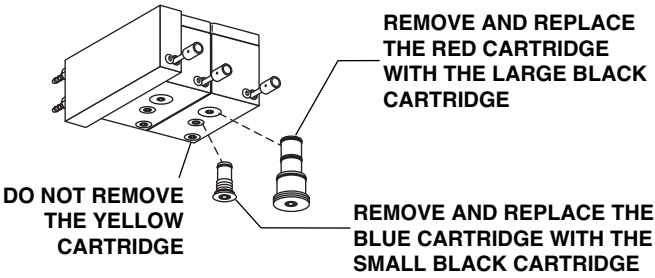
REMOVE AND REPLACE THE RED CARTRIDGE WITH THE LARGE BLACK CARTRIDGE
DO NOT REMOVE THE YELLOW CARTRIDGE
REMOVE AND REPLACE THE BLUE CARTRIDGE WITH THE SMALL BLACK CARTRIDGE

Figure 13. Handpiece Dry Block Conversion

Oil Collector

The oil collector gauze on your unit needs to be changed once a week for normal usage. Change more often for heavier use.

1. Remove the oil collector jar from the unit and discard the old gauze (*see Figure 14*).
2. Fold in quarters a new two-inch square gauze pad and place against the spring inside the jar.
3. Screw the oil collector jar onto the unit but do not overtighten.

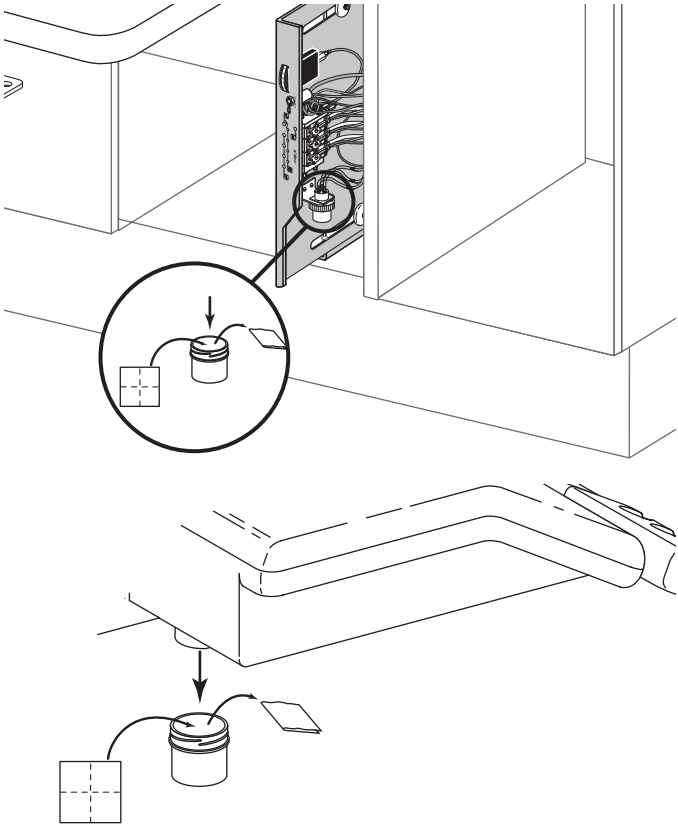

Figure 14. Oil Collector

Syringe

To operate the syringe:

- Move the on/off toggle to the ON position.
- Air – Press the right button down.
- Water – Press the left button down.
- Spray – Press both buttons down.

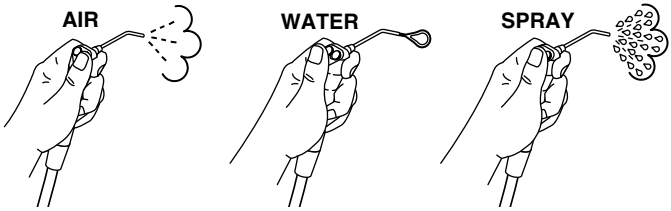

Figure 15. Autoclavable Syringe

Refer to your ***Autoclavable Syringe Owner's Guide*** *(A-dec Publication No. 85.0680.00)* for complete syringe operation and maintenance instructions.

Care Instructions

For recommended asepsis instructions, refer to your ***Equipment Asepsis Owner's Guide*** *(A-dec Publication No. 85.0696.00)*.

For recommended self-contained water system care, refer to ***A-dec Self-contained Water System Owner's Guide*** *(A-dec Publication No. 85.0675.00)*.

Assistant's Instrumentation

To operate the autoclavable HVE and saliva ejector, simply turn the control valve.

The autoclavable HVE and saliva ejector can be easily converted for right- or left-hand operation. To convert, press the control valve out of the valve body. Rotate the control valve 180°, then press it back into the valve body.

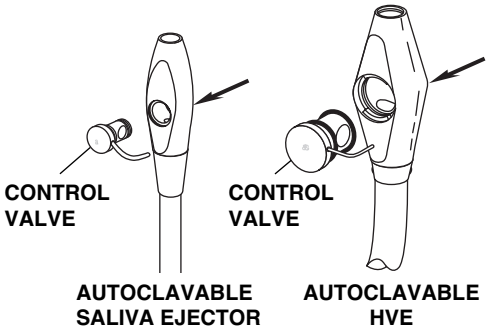

Figure 16. Right- to Left-Hand Conversion

The solids collector prevents solids from entering the central vacuum system.

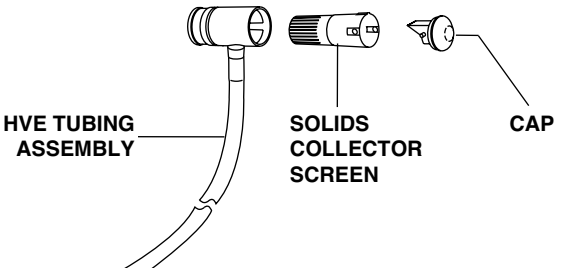

Figure 17. Solids Collector

Refer to your ***Assistant's Instrumentation Owner's Guide*** *(A-dec Publication No. 85.2610.00)* for more instructions.

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Utility Area Controls and Functions

To access the utility area, simply lift out the angled lower cover located under the control head.

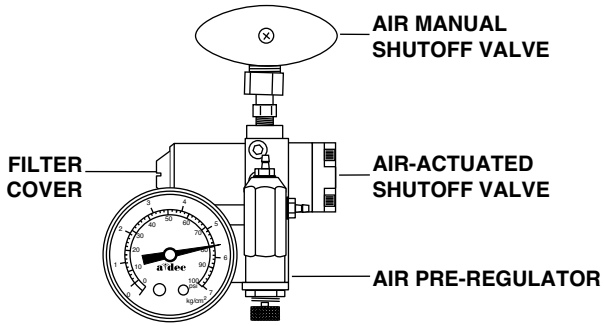

Figure 18. Air Controls

Air Manual Shutoff Valve

The air manual shutoff valve controls the air supply to the unit. To prevent leaks, these valves should remain fully open (turned counterclockwise) except while your unit is being serviced.

Air-actuated Shutoff Valve

The **air-actuated shutoff valve** automatically shuts off air to the system when the master on/off toggle is in the OFF position.

Air Filter

The air filter prevents solids from entering the unit. The procedures for checking and replacing the filters are given on page 23.

Air Pressure Pre-Regulator

The air pressure pre-regulator controls the air pressure in the unit. The procedure for adjusting system pressure is given on page 21 and 22.

Vacuum Outlet

The office central **Vacuum System Outlet** is located in the utility center. A flexible tube connects your vacuum instruments to the outlet.

For information about your assistant's vacuum instruments, refer to ***Assistant's Instrumentation Owner's Guide*** *(A-dec Publication No. 85.2610.00)*.

System Air Pressure Adjustments

The air pre-regulator is located in the utility area inside the cabinet base. Before making any adjustments, verify that the air compressor is turned on and that it maintains 80–100 psi (552–690 kPa) pressure in the tank. If it doesn't, refer to the compressor instructions.

1. Be sure that the manual shutoff valve is fully open (counterclockwise). Turn the system ON, and check the pressure gauge in the utility area *(see Figure 19)*. Air pressure should be 70–80 psi (483–552 kPa).
2. While watching the gauge, operate the syringe. If the system air pressure drops by any more than 15 psi (103 kPa), check for clogged filters.
3. If adjustment of the air pressure is required, turn the pre-regulator knob clockwise to increase pressure, or counterclockwise to decrease.

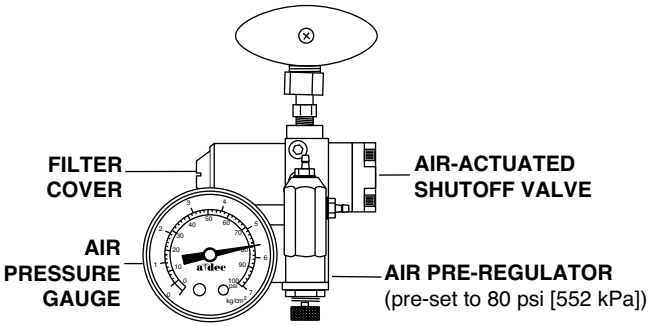

Figure 19. Air Manual Shutoff Valve

NOTE

When decreasing system air pressure, you will not see the air gauge in the utility center change until you relieve pressure from the system. Activate the syringe for a few seconds, then check the gauge. Repeat this process each time you make an adjustment to decrease pressure.

4. Test the unit by operating the syringe and handpieces for several seconds. Make sure the air pressure is maintained.

Filter Maintenance

Air Filter Element

Air passes through a filter before entering the regulator. A clogged filter can restrict flow to the regulator and should be replaced immediately.

Checking for a Clogged Air Filter

To check for a clogged air filter, move the master on/off toggle to the ON position, then remove the utility area cover under the control head. While watching the air pressure gauge in the utility area *(see Figure 20)*, press the syringe air button. If the air pressure indicated by the gauge drops by more than 15 psi (103 kPa), the filter element is clogged and must be replaced.

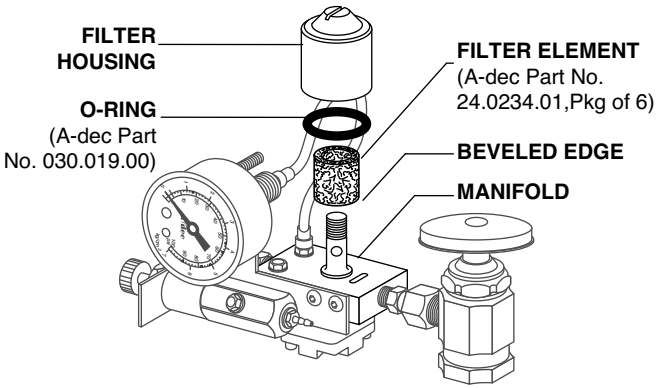

Figure 20. Air Filter Replacement

Inspecting the Filter
To inspect or replace a filter element, move the master on/off toggle to the OFF position, then close the manual shutoff valve. Bleed the system of air pressure by operating the syringe buttons. Using a flat-blade screwdriver, remove the filter housing from the air pre-regulator assembly *(see Figure 20)* and remove the filter.

If the filter is visibly clogged or discolored, replace it. Order A-dec Part No. 24.0234.00, or 24.0234.01 for a package of six.

When installing a new filter, notice that one end of the filter has a beveled edge. Install the filter with the beveled edge facing the manifold *(see Figure 20)*. The system will not work properly if the filter is installed incorrectly.

Maintenance

Handpiece Controls
- Handpiece Flush .....page 8
- Oil Collector .....page 16

Utility Controls
- System Air Pressure Adjustments .....page 21

Filter Maintenance
- Air Filter Element .....page 23

Also refer to the following A-dec documentation for more maintenance information:

Autoclavable Syringe
- ***Autoclavable Syringe Owner's Guide*** *85.0680.00*

Care Instructions
- ***Equipment Asepsis Owner's Guide*** *85.0696.00*
- ***Self-contained Water Owner's Guide*** *85.0675.00*

Power Supplies
- ***Floor Boxes Owner's Guide*** *85.2611.00*

Adjustments and Specifications

Handpiece Controls
- Drive Air Pressure.....page 5
  (Refer also to your handpiece documentation for the manufacturer's dynamic drive air pressure specification.)
- Coolant Air Flow .....page 6
- Coolant Water Flow .....page 7
- Mounting Arm .....page 10
- Doctor's/Assistant's Instrumentation Arm .....page 12
- Holder Bar .....page 12
- Handpiece Holder .....page 13

Service Requirements for Unit Operation:

Minimum Air:
2.50 cfm (70.80 L/min) at 80 psi (551 kPa)

Minimum Vacuum:
12 cfm (339.84 L/min)
at 8 inches of mercury (27 kPa)

Any optional non-A-dec attachments and/or accessories must comply with EN 60601-1 and EN 60601-1-2.

Weights of optional attachments:
Tooth Dryer: 1 lb (.45 kg)
Intra-oral Light Sources: 1 lb (.45 kg)
Curing Light: 3 lb (1.36 kg)

Specifications are subject to change without notice.

Identification of Symbols

Recognized by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Recognized with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

UL listed to US (UL 544) and Canadian (CAN/CSA C22.2, No. 125) safety standards.

Classified by Underwriters Laboratories Inc. ® with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1. Classified with respect to electric shock, fire, mechanical and other specified hazards only in accordance with CAN/CSA C22.2, No. 601.1.

Conforms to European Directives *(refer to Declaration Statement)*

Protective earth (ground).

Functional earth (ground).

Attention, consult accompanying documents.

TYPE B APPLIED PART.

CLASS II EQUIPMENT.

Classification of Equipment (EN 60601-1)

Type of shock protection:

CLASS I EQUIPMENT
(Dental Chairs, Dental Lights, & Power Supplies)

CLASS II EQUIPMENT
(Chair, Wall, & Cart Mounted Delivery Systems)

Degree of shock protection:
TYPE B APPLIED PART (All products)

Degree of protection against water ingress:
ORDINARY EQUIPMENT (All products)

Mode of operation
CONTINUOUS OPERATION
(All models except Dental Chairs)

Mode of operation
CONTINUOUS OPERATION
WITH INTERMITTENT LOADING (Dental Chairs)

ENVIRONMENTAL

Storage - Temperature: -40°C to 70°C (-40°F to 158°F)
Relative Humidity: 95% maximum

Operating - Temperature: 10°C to 40°C (50°F to 104°F)
Relative Humidity: 95% maximum

ELECTROMAGNETIC COMPATIBILITY

This equipment has been tested and found to comply with the limits for medical devices in IEC 601-1-2:1994. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. Contact A-dec Customer Service if you have any questions.

FLAMMABLE GASSES

Not suitable for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide.

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